G. H. ELMORE.

JIG.

APPLICATION FILED JULY 2, 1913.

1,132,464.

Patented Mar. 16, 1915.

2 SHEETS—SHEET 1.

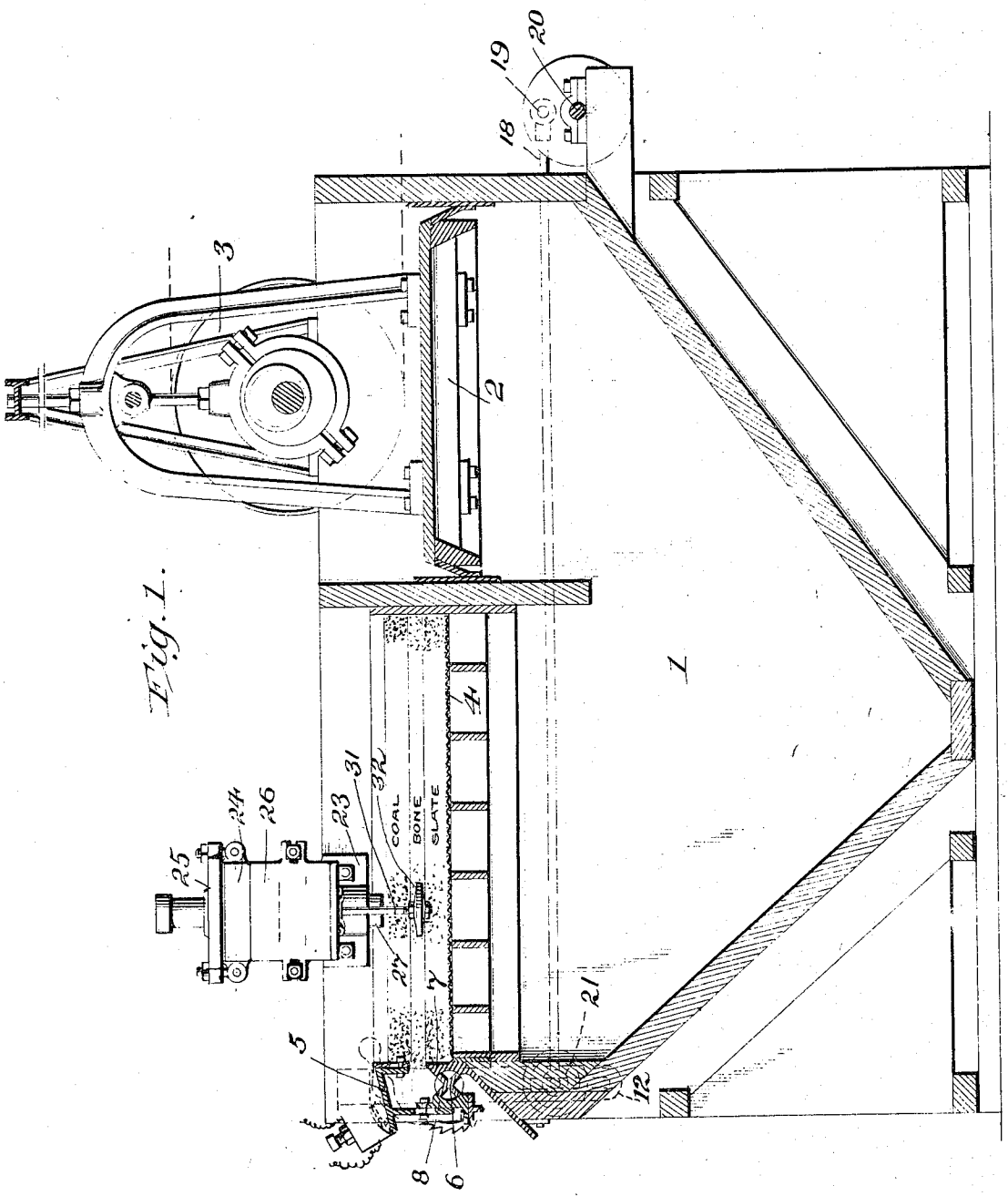


Fig. 1.

Witnesses:
E. H. Raeder
A. Dodge

Inventor:
Guy H. Elmore,

By Dodge and Dodge,
Attorneys

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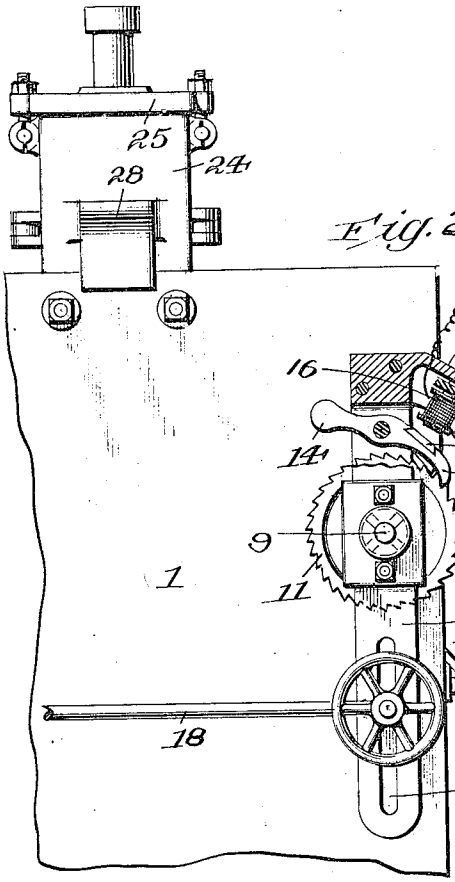
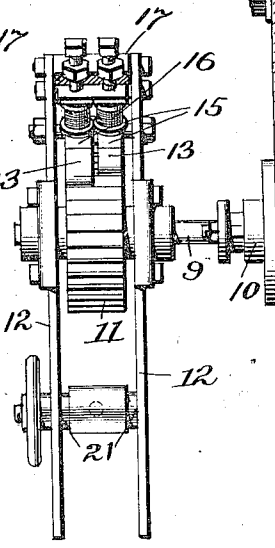


Fig. 2.



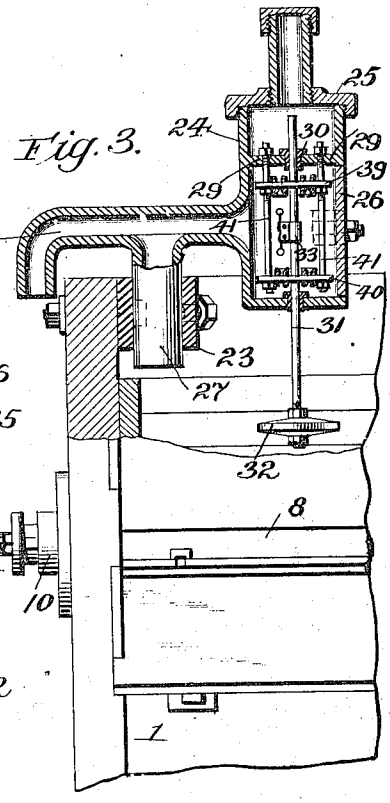


Fig. 3.

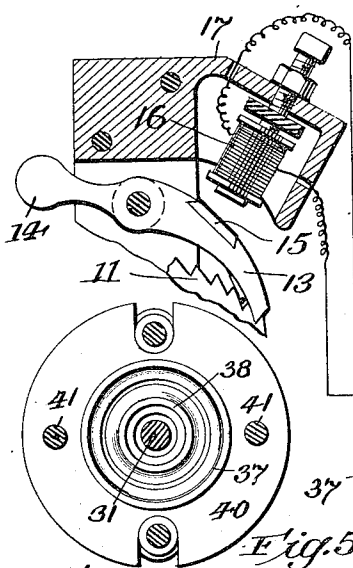
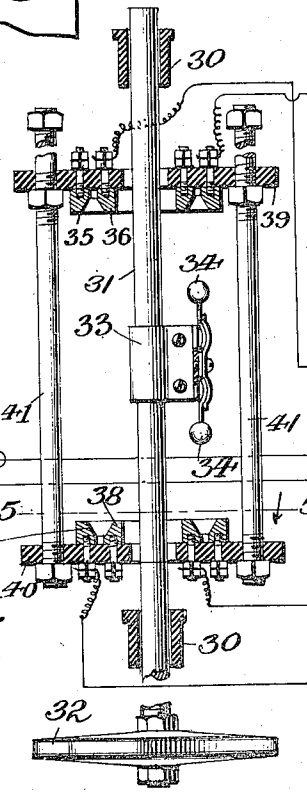


Fig. 5.



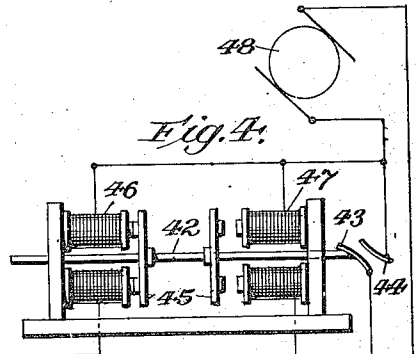


Fig. 4.

Witnesses:
C. H. Raeder
H. Smith.

Inventor:
Guy H. Elmore,
By Dodge and Sons,
Attorneys

UNITED STATES PATENT OFFICE.

GUY H. ELMORE, OF SWARTHMORE, PENNSYLVANIA.

JIG.

1,132,464. Specification of Letters Patent. Patented Mar. 16, 1915.

Application filed July 2, 1913. Serial No. 776,986.

To all whom it may concern:

Be it known that I, GUY H. ELMORE, a citizen of the United States, residing at Swarthmore, in the county of Delaware and State of Pennsylvania, have invented certain new and useful Improvements in Jigs, of which the following is a specification.

This invention relates to jigs and particularly to a mechanism for controlling the operation of the discharge valve thereof to maintain a practically constant depth of bed in the jig.

The device is in the nature of an improvement of that shown in my prior Patent No. 997,609, granted July 11, 1911, and involves certain improvements in the arrangement of the float and contact mechanism, as well as the elimination of the clutch mechanism formerly used and the substitution therefor of a magnetic disengaging device for the valve drive-ratchets.

The details of the construction are shown applied to a jig intended for jigging coal, in the drawings, wherein:—

Figure 1 is a vertical section through a jig with my invention applied; Fig. 2 is an elevation of a part of the side of the jig, the ratchet valve-driving mechanism being shown partly in section; Fig. 3 is an elevation, partly sectional, of the end of the jig, showing the ratchet valve-driving mechanism and the float and switch mechanism; Fig. 4 is an enlarged sectional view of the float switch mechanism and the magnetic pawl throwout, with the wiring and the magnetic relay switch shown in diagram; and Fig. 5 is a section on the line 5—5 of Fig. 4.

In the drawings 1 represents the jig tank, 2 the plunger, 3 the driving mechanism for the plunger, 4 the screen, 5 the overflow for the lighter materials, and 6 the discharge valve for the heavier materials. The particular form of this valve is not a matter of vital importance so far as the operation of the controlling device is concerned, but I have chosen for purposes of illustration the valve described and claimed in my copending application, Serial No. 715,080, filed August 14, 1912. Consequently no claims are made herein to the form of the valve.

The valve 6 consists of a rotatable cylindrical bar having longitudinal grooves or ports in the periphery. The valve fits closely between sealing plates 7 and 8, the plate 7 forming the overflow for the heavy material from the jig and the plate 8 being adjustable to secure a tight sealing action. As the valve rotates it carries in its grooves or ports solid material mixed with water from the jig but does not permit the free outflow of water.

The valve is rotated by a shaft 9 which extends through a stuffing box 10 and carries a ratchet wheel 11. Journaled on shaft 9 and straddling ratchet 11 is a bifurcated yoke or lever 12 carrying the pawls 13 unequal in length and adapted individually to engage the teeth in ratchet 11. The pawls 13 have rearward extensions 14, which nearly balance them so that only slight force is necessary to hold them up. The pawls are made of bronze so as to have no magnetic attraction for ratchet 11 but carry iron inserts or armatures 15, and in coöperative relation with these inserts are magnets 16 carried on yoke 12, beneath a protective hood 17, as shown.

The yoke 12 is rocked by a connecting rod 18 connected to crank 19 on shaft 20 which shaft is constantly driven by any suitable means during the operation of the jig. The range of throw of the yoke 12 may be adjusted by clamping connecting rod bearing 21 in various adjusted positions in slots 22 on the yoke 12.

The pawls 13 in riding over the teeth are lifted nearly into contact with magnets 16 and if these magnets be energized the pawls are held up in disengaged position. When the magnets are deënergized they drop down into operative position. Thus valve 6 is operated only when magnets 16 are deënergized.

The float switch mechanism is carried on a bracket 23 bolted to the side of the jig as shown. The switch mechanism is inclosed in case or box 24 having a removable top cover 25 and a removable side cover 26 of the forms clearly shown in the drawings. The case 24 is carried on a stem 27 vertically adjustable in bracket 23 and formed inte-

grally with tube 28 for the connecting wires. (The wires are omitted in Figs. 2 and 3). Case 24 has a horizontal partition 29 and mounted in this and in the bottom of the case are insulator guides 30 for the float rod 31. The rod 31 carries a disk like float 32 having slightly conical faces to enable it to find its level more readily in the loose material on the screen, the weight of the float and rod and the relative displacement of the float being so adjusted as to maintain the float on top of the proper stratum of material in the jig. The rod 31 carries a bracket 33 with resiliently mounted contact balls 34 which may bridge in the opposite limiting positions of the float either of two pairs of concentric contact rings 35, 36 and 37 38. The rings 35 and 36 are carried on an insulating plate 39 and the rings 37 and 38 on a similar plate 40. The plates 39 and 40 are suspended in properly spaced relation from partition 29 by the rods 41.

Thus in the uppermost position of the float rings 35 and 36 are electrically connected while in the lowermost position rings 37 and 38 are connected.

In connection with the mechanism so far described I make use of a magnetic relay switch consisting of the sliding bar 42 adapted to carry contact 43 into and out of contact with fixed contact 44. The bar 42 carries armatures 45 which are alternately attracted in opposite directions by two pairs of electric magnets 46 and 47.

A dynamo or other suitable source of current 48 has one terminal connected to ring 35, ring 38 and one terminal of magnets 16. The other terminal of source 48 is connected to one terminal of magnets 46, one terminal of magnets 48 and to contact 44. The second terminal of magnets 16 is connected to contact 43 and the second terminals of magnets 46 and 47 are respectively connected to rings 36 and 37 (see Fig. 4).

Thus when the float rises to its highest position rings 35 and 36 are electrically connected. Current then flows through magnet 46 drawing armatures 45 to the left and disconnecting contacts 43 and 44. This deenergizes magnets 16 releasing pawls 13 which drop into operative position driving the jig valve 6. This will gradually lower the level of the bed until float 32 has reached its lowest position and electrically connects rings 37 and 38. This energizes magnets 47, drawing armatures 45 to the right connecting contacts 43 and 44 to energize magnets 16 and hold pawls 13 out of action. Throughout nearly the entire action, magnets 46 and 47 will be deënergized while magnets 16 are energized for only limited periods. This results in a decided saving of current, and because of the simple throwout device used only a light current need be used. The use of a single float makes a simpler construction and has been found to give satisfactory results, while the vertical adjustability of case 24 provides for the necessary adjustment of the float with reference to the jig bed. The action of the device in keeping the lower jig bed at a practically constant depth, by bringing the discharge valve into and out of action is substantially the same as that of my prior patented structure but the ease of manufacture and economy in the use of electrical current give the present device certain commercial advantages.

Having thus described my invention, what I claim is:—

1. The combination with a jig having a screen and a discharge valve located adjacent said screen, of a ratchet wheel adapted to drive said valve; a lever; means for oscillating said lever; a pawl carried by said lever and adapted to engage the teeth on said ratchet wheel to drive the same; an electro-magnet adapted when energized to hold said pawl away from said ratchet wheel; a float adapted to rest in material on said screen; and a circuit closing device connected with the float and adapted to be actuated by the rise and fall thereof and interposed in the circuit through said magnet to control the same.

2. The combination with a jig having a screen and a discharge valve located adjacent said screen, of a ratchet wheel adapted to drive said valve; a lever: means for oscillating said lever; a plurality of pawls carried by said lever and adapted individually to engage the teeth on said ratchet to drive the same; electro-magnets adapted when energized to hold said pawls away from said ratchet wheel; a float adapted to rest in material on said screen; and a circuit closing device connected with the float and adapted to be actuated by the rise and fall thereof and interposed in the circuit through said electro-magnets to control the same.

3. An electro-magnetic throw-out device for jigs provided with a rotary discharge valve and a float controlled circuit closer, comprising in combination, a ratchet wheel in driving relation with said discharge valve, a rocker arm mounted coaxially with said ratchet wheel, a pawl carried by said rocker arm and adapted to engage said ratchet wheel, an electro-magnet carried by said rocker arm and adapted to hold said pawl out of engaging relation with said ratchet wheel, driving connections for rocking said rocker arm, and suitable electric connections from said electro-magnet to the float controlled circuit closer.

4. The combination with discharge valve drive mechanism for jigs, including a ratchet, a rocker arm and a pawl carried by

said rocker arm to engage said ratchet; of an electro-magnet carried by said rocker arm and adapted to withhold said pawl from engaging relation with said ratchet; and suitable electrical connections for said magnet to permit it to be energized and de-energized to retract and release said pawl.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GUY H. ELMORE.

Witnesses:

HORACE A. DODGE,

BENNETT S. JONES.